

Remarks

Summary

Claims 1-13 were pending. Claim 1 has been rewritten. No new matter has been added as a result of this amendment.

IDS

In the Office Action of June 17, 2003, the Examiner stated that the IDS filed September 12, 2001 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. Applicants submit that no such IDS was filed. The only IDS Applicants filed was on December 6, 2000, with the Application. In the IDS filed on December 6, 2000, Applicants included a copy of the single reference cited and the Examiner appropriately initialed and returned a copy of the PTO 1449 in the last Office Action.

Objection to Drawings

In the Office Action of June 17, 2003, Figures 5 and 6 were objected to as not being designated by a legend such as --Prior Art-- because only that which is old is illustrated. Applicants submitted a corrected version of Figs. 5 and 6 with corrections marked in red in the Preliminary Amendment submitted on December 6, 2000 and requested that the Examiner approve the corrections. Applicants enclose a copy of the Preliminary Amendment for the Examiner's convenience. Applicants herein resubmit the corrected drawings and again request that the Examiner approve the corrections. Applicants will submit formal drawings upon receiving Notice of Allowance.

Rejection of Claims

In the Office Action of June 17, 2003, Claims 1-2, 6-7, and 11-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Fujioka (U.S. Patent 6,552,762) and Claims 3-5 and 8-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA in view of Fujioka further in view of Miyazaki (U.S. Patent 5,978,061). Applicants have amended Claim 1 and submit that pending Claims 1-13 overcome the rejection.

Claim 1 recites that the color filter substrate has a visible area that contains an effective display area and a margin area which is outside the effective display area. The color filter layer, the transparent electrode, and the alignment layer of the color filter substrate are formed inside a sealing material in a region which includes the effective display and margin areas. The color filter layer is configured such that light impinging on the color filter substrate in all areas in which the color filter layer is disposed is transmitted through the color filter substrate. The alignment layer is substantially planar at least in the visible area.

One advantage of the arrangement of Claim 1 is that the thickness of liquid crystal cells may be made uniform and a reflective liquid crystal display having improved display quality can be obtained. In addition, light that impinges on the color filter substrate in an area in which the color filter layer is disposed is transmitted through the color filter substrate, thereby permitting the display to be sufficiently visible even under conditions of low luminescence.

Neither AAPA nor Fujioka anticipate or suggest such an arrangement. Both teach away from the embodiment of Claim 1 and illustrate (see Figs. 9, 12, 13, and 17 of Fujioka, for example) arrangements in which the alignment layer terminates in the effective display area and thus is not substantially planar in at least in the visible area. Fujioka in particular teaches away from such an arrangement, teaching instead arrangements in which neither a counter electrode nor an alignment layer is formed in sealing material side of the margin area. Moreover, Fujioka is motivated to prevent reflections of light at portions not contributing to the liquid crystal display and suppress light reflections onto TFTs in a reflection type LCD. Fujioka does not suggest and is not motivated to provide the advantage of the arrangement of Claim 1, in which degradation of the display quality is prevented through uniformity of the thickness of liquid crystal cells.

Furthermore, Fujioka is directed towards the field of TFT liquid crystal devices while AAPA is directed towards the field of STN liquid crystal devices. As these technical fields are entirely different, Applicants submit that no motivation exists to combine the color filter in the TFT liquid crystal device of Fujioka with the STN liquid crystal device of AAPA.

For at least these reasons, none of the cited references, alone or in combination, cited by the Examiner anticipate or suggest the arrangement of Claim 1. Thus, Claims 1-2, 6-7, and 11-13 are patentable over the cited references.

Moreover, Claim 12, for example, is independently patentable over the cited references. Claim 12 recites that the color filter layer is formed directly on the reflective layer. Fujioka, on the other hand, teaches that a highly reflective material is disposed on the TFTs (thereby shielding the TFTs from light and achieving one of his motivations) and the color filter is formed on the substrate opposing the reflective layer. Fujioka thus teaches directly away from the arrangement of Claim 12. Similarly, Miyazaki expressly teaches away from the arrangement of Claim 12, instead disclosing the use of a light shielding layer between the color filter layer and the substrate.

Regarding the rejection of Claims 3-5 and 8-10 over the combination of Miyazaki with AAPA and Fujioka: Applicants still maintain that no suggestion or motivation exists to combine these references. More specifically, Miyazaki teaches the use of a light shielding layer between the color filter layer and the substrate (either on the substrate or on the light shielding layer), while AAPA teaches the undesirability of using a light shielding layer due to the inability to view the display in low background conditions. Miyazaki thus expressly teaches away from AAPA.

Furthermore, Miyazaki is directed to an entirely different structure from that of AAPA or Fujioka and expressly teaches away from the arrangements of these references as well as those in the claims. Miyazaki, unlike AAPA, is not directed towards a reflective liquid crystal display. Nor can the arrangements of Miyazaki be easily incorporated in a reflective liquid crystal display. In addition, Miyazaki is entirely directed towards using pillar shaped spacers that contain a stack of the color filters rather than spherical spacers to maintain the distance between the upper and lower substrates. In comparison, the color filters of Claims 3-5 and 8-10 reduce the amount of light reflected by the reflective layer.

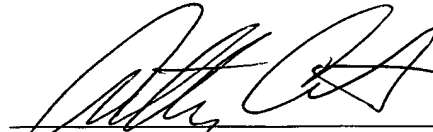
Applicants thus submit that no motivation exists to combine AAPA or Fujioka with that of Miyazaki.

For at least these reasons, none of the references cited by the Examiner, alone or in combination, anticipate or suggest the arrangement of Claims 3-5 and 8-10. Thus, amended Claims 3-5 and 8-10 are patentable over the cited references.

Conclusion

In view of the amendments and arguments above, Applicants respectfully submit that all of the pending claims are in condition for allowance and seek an early allowance thereof. If for any reason the Examiner is unable to allow the application in the next Office Action and believes that a telephone interview would be helpful to resolve any remaining issues, he is respectfully requested to contact the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Anthony P. Curtis', is written over a horizontal line.

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